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ABSTRACT

A study examined factors associated with achievement for African-American eighth graders and whether differences existed relative to poverty status and depth of poverty. Data were extracted from the National Educational Longitudinal Study of 1988. An independent data set of 3,009 students was created including information for students identifying themselves as "Black, not of Hispanic origin" and reporting annual family income in ranges that matched closely with the official federal poverty thresholds for 1988. To examine the depth of poverty, two subgroups were created according to whether the reported income was above or below 50 percent of the poverty threshold. A t-test determined if statistically significant differences existed in test score means for students living in poverty versus not living in poverty, and for students grouped by depth of poverty. Analysis of variance tests determined what portion of the variance in student achievement was due to the selected independent variables. Findings indicated that, for African-American eighth graders, students not living in poverty were more likely to achieve at a higher level, as measured by standardized reading and math tests, than those living in poverty. With the exception of parents' educational level, general preparedness for class, and personal study factors, few variables were identified that contributed to achievement. Serious consideration must be given to how interventions can be introduced within the public schools, working with family units to promote conditions that would enhance achievement by breaking the poverty cycle. (Contains 23 references.) (YLB)

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The Role of the Agricultural Educator in Meeting the Needs of a Diverse Student Population

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Introduction

Diversity is one of the key buzzwords in the 1990s. Unfortunately, minority issues and questions of diversity are problems confronting most colleges of agriculture and departments of agricultural and extension education throughout the US (Bowen, 1993). To promote diversity, most universities have offices and programs that focus on diversity, educational equality, and affirmative action plans (Atwater & Lyons, 1993). These programs were initiated to help inform, educate, and meet federal guidelines. However, it is a reality that some individuals remain perplexed by all the attention this problem has generated. Still, other authors try to resolve the problem by indicating the great need for minorities to enter the field of agriculture (Larke & Talbert, 1993).

It is nearly thirty years since most of the civil rights legislation was passed. Why is this still a significant problem? Serious questions remain regarding the willingness of educators to have a major impact on this troubling problem. Why don't minority students want to take advantage of the tremendous opportunities in the land-grant system? Why is it so difficult to attract and retain minority students in agricultural and extension education programs? The following sections of this paper will describe a phenomenon that is pervasive within the African-American community in the US. The research presented will begin a process of illuminating why institutions and invidivuals still struggle with minority problems.

Purpose and Objectives

The July 1993 National FFA Membership Preliminary Report reveals important information about gender, ethnicity and age distributions of members. About 88% of the members, nationally, are white, with minority groups represented in small numbers. Statistics show the numbers of minorities enrolling in the FFA are up from ten years ago. If this continues, the organization may become more diverse in time. While many studies exist that compare achievement and related factors between and among various ethnic groups, little information is available that looks at depth of poverty and its relationship to factors influencing achievement. The purpose of this study was to examine factors associated with achievement for African-American eighth graders and whether differences exist relative to poverty status and depth of poverty. Objectives were to:

1. Identify factors related to achievement for African-American eighth graders; and,
2. Determine the relative amount of influence of those factors on achievement for groups classified by poverty status and depth of poverty.

Methods and Data Analysis

Data were extracted from the National Educational Longitudinal Study of 1988 (NELS:88). The NELS:88 dataset resulted from a two-stage stratified probability design used to select a nationally representative sample of schools and students. A total of 24,599 randomly selected eighth graders from 1,052 schools participated. An independent dataset was created including information for students self-identifying as "Black, Not of Hispanic Origin."

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Identification of poverty status was made by use of reported annual family income in ranges that matched closely with the official federal poverty thresholds for 1988, controlling for family size. To examine depth of poverty, two subgroups were created according to whether the reported income was above or below 50% of the poverty threshold. The NELS:88 response categories for ranges of yearly family income did not match exactly with the federal poverty thresholds by family size. However, none selected exceeded 125% of the thresholds--a figure utilized for eligibility for some assistance programs--and most were within several hundred dollars. Since depth of poverty reflects a relative circumstance, this was not a concern in its calculation. The less than 50% of the poverty threshold group was determined by their reported occurrence in an income category range that contained one-half of the threshold income. A review of the literature resulted in the identification of variables selected for the analysis. The variables are indicators of several key factors influencing student achievement: educational attainment of parents, a home environment where reading and information are valued, a stable family structure, limited television viewing, and regular performance of school assignments at home (Patrick, 1991). Additional variables were selected to examine student attitudes and various school-related behaviors.

A t-test determined if statistically significant differences existed in test score means for students living in poverty versus not living in poverty, and for students grouped by depth of poverty. Analysis of variance (ANOVA) tests determined what portion of the variance in student achievement was due to the selected independent variables. A significance level of 0.05 was selected for all analyses.

Results

The final data set contained valid data for 3009 students, with nearly equal numbers of males (48.9%) and females (51.1%) in the sample. After controlling for family size, and recoding to distribute by federal poverty limits, a frequency distribution revealed that 2500 students lived in poverty. Of those students living in poverty, 75.4%, or 1886, were classified as living below 50% of the poverty threshold.

Overall yearly family income, for all African-American students in the sample, had a moderate positive association with student achievement as measured by a reading/math composite test score ($r=0.33$, $p = 0.0001$). A t-test procedure revealed there is a significant difference in test score means between the group living in poverty and the group not living in poverty. A second t-test comparing test score means between the group living at <50% below the poverty threshold and the group living at >50% of the poverty threshold also yielded significant differences (Table 1). In addition to the t-tests, recoding test scores into quartiles to examine frequencies for groups by poverty status and depth of poverty, permitted further comparisons. There are differences in test scores by both poverty status and depth of poverty. Only 19.4% of students living in poverty scored at or above 50% on the standardized math and reading composite test as compared to 44.4% of students not in poverty. The same trend is evident for the subgroups of those students living in poverty--a larger proportion of those in the higher income group (30.3% vs 16.0%) scored at or above 50%.

To identify individual factors contributing to variances in test scores, analysis of variance (ANOVA) procedures tested single variables. Nearly all one-way ANOVAs yielded highly significant models ($p < .0001$), but only parents' educational level had an R^2 value greater than 0.10 (.1169). Comparing the one-way ANOVAs by poverty status and depth of poverty yielded different results for the two groups--parents' educational level contributed to variances in test scores to a greater extent for persons not living in

poverty, but not if considering depth of poverty (Table 2). These results do not provide much evidence that parents' educational level, overall, contributes a great deal to achievement for African-American eighth graders in the sample. However, evaluating the results from a comparative standpoint does provide useful information. There is nearly 14% more contribution to achievement from parents' education for those students not living in poverty than for those living in poverty. This is not a startling revelation given the well-known positive correlation between education and income. However, an examination of depth of poverty reveals little difference in the contribution of parents' education to achievement between the groups living above and below 50% of the poverty threshold (3% vs 4%).

Table 1. T-test of Test Score Means: By Poverty Status and Depth of Poverty

N	Mean	S.D.	DF	t	p
Test #1					
Poverty	2381	43.3	8.0	2870	13.3	0.0000
Non-poverty	491	48.9	9.8		
Test #2					
<50% threshold	1789	42.4	7.6	2379	9.1	0.0000
>50% threshold	592	45.9	8.7		

Table 2. Contribution of Parents' Educational Level to Achievement

Source	df	SS	SS	F	p	R^2
----------Overall----------						
Parents' education	5	24,365.3	4060.9	61.38	0.0001	.1169
----------Level 1: Living in Poverty----------						
Parents' education	5	7546.2	1257.7	20.34	0.0001	0.0490
-----Depth of Poverty-----						
<50% threshold	5	3594.7	599.1	10.61	0.0001	0.0347
>50% threshold	4	1926.1	385.2	5.25	0.0001	0.0429
----------Level 2: Not Living in Poverty----------						
Parents' education	4	8880.7	1776.1	22.55	0.0001	0.1886

A look at Table 3 provides some insight into the distribution of parents' educational level by poverty status and depth of poverty. We can see that slightly over 53% (53.2%) of the parents in this sample, living in poverty, have a high school education, and some postsecondary education, as compared to 61.2% for the group not living in poverty. Examination of this educational level by depth of poverty reveals that almost 70% (69.4%) of the persons living in poverty, at >50% of the poverty threshold, have more than a high school education as compared to 47.7% for the group living below 50% of the poverty threshold. The greatest difference exists for the educational level of high school

or less, in which 43.0% of the persons in poverty are contained as compared to only 13.2% for the group not living in poverty.

Table 3. Parents' Educational Level by Poverty Status and Depth of Poverty.

Poverty Status			Depth of Poverty	
Parents' Educational Level (Group %)	In Poverty N (Group %)	Not in Poverty N (Group %)	<50% of threshold N (Group %)	>50% of threshold N
High school or less	1041 (43.0)	67 (13.2)	888 (49.2)	153 (25.9)
Postsecondary; not beyond 4-yr degree	1286 (53.2)	311 (61.2)	860 (47.7)	426 (69.4)
Postsecondary; >4-year degree	92 (3.8)	130 (25.6)	57 (3.2)	35 (5.7)
Total	2419	58	1805	614

Analysis of variance tests performed on selected variable groups, and controlled by poverty status and depth of poverty, yielded many significant models. The analyses were sorted by these groups, and each group's results compared by: living in poverty, not living in poverty, living at <50% of the poverty threshold, and living at >50% of the poverty threshold. Two groupings had at least one ANOVA with an R^2 value of 0.20 or higher. These were selected for discussion based on having at least one R^2 value of 0.20 or higher, and differences in contribution to achievement among poverty status groups or depth of poverty groups of 10% or higher. Several model variable groupings contained significant interactions between their variables which eliminated them from consideration. The two models selected for comparison based on the above criteria were:

1. General preparedness for class (going to class with pencil and paper, books, and homework); and,

2. Personal study factors (place to study at home, time reading on own, hours per week spent on homework).

When compared using poverty status and depth of poverty, analysis of the variable groupings yielded similar findings to the univariate ANOVA examining parents' education. Namely, that students classified by poverty status differ more in their responses to influences on achievement that those grouped by depth of poverty.

General Preparedness for Class

There is a 13.1% difference by poverty status in the contribution to variances in test scores by the model for class preparedness. This compares to a difference of only than 4.4% by depth of poverty classification (Table 4).

Table 4. Contribution of Preparedness for Class Model to Achievement

Source	df	SS	SS	F	p	R^2
----------Level 1: Living in Poverty----------						
Preparedness	61	12,177.2	199.6	3.15	0.0001	0.0884
-----Depth of Poverty-----						
<50% threshold	61	8469.2	138.8	2.44	0.0001	0.0927
>50% threshold	51	5622.6	110.2	1.48	0.0213	0.1369
----------Level 2: Not Living in Poverty----------						
Preparedness	61	9510.4	202.3	2.42	0.0001	0.2198

Personal Study Factors

There is a 23.1% difference, by poverty status, in the contribution to variances in test scores by the model for personal study factors. This compares to 14.2% by depth of poverty classification (Table 5).

Table 5. Contribution of Personal Study Factors to Achievement

Source	df	SS	SS	F	p	R^2
----------Level 1: Living in Poverty----------						
Personal factors	92	14,827.1	161.1	2.55	0.0001	0.1140
-----Depth of Poverty-----						
<50% threshold	89	9364.8	105.2	1.83	0.0001	0.1090
>50% threshold	75	9727.6	129.7	1.87	0.0001	0.2511
----------Level 2: Not Living in Poverty----------						
Personal factors	70	14,205.9	202.9	2.72	0.0001	0.3452

Discussion

Several definitive statements can be made as a result of this study. For African-American eighth graders, students not living in poverty are more likely to achieve at a higher level, as measured by standardized reading and math tests, than those living in poverty. In addition, for those students living in severe conditions of poverty, achievement levels will be significantly below those of students living at >50% of the poverty threshold. While there are significant differences in the achievement levels by both poverty status and depth of poverty, the differences are not substantial from a practical standpoint for the group living in poverty. These results raise several other questions concerning the relationship between income and achievement which should be addressed in future research--namely, at what point does income begin to play a stronger role in achievement and what factors may ameliorate its influence? Clearly, crossing the poverty threshold makes a difference. Questioning whether it is the income level or related circumstances which evolve from, and possibly cause, poverty may be the key.

The information gained from the analysis of variance tests was less informative from the standpoint of identifying factors associated with achievement than for the information gained by comparison of poverty status and depth of poverty. Further data analysis could probably yield additional significant models that would have higher R^2 values and thus be useful in designing compensatory programs to positively influence achievement. From that standpoint, one objective of this study was not met. With the exception of parents' educational level, general preparedness for class, and personal study factors, few variables were identified that contributed, from a practical perspective, to achievement. One could also argue that all of the factors just cited are indicators of the general home environment and further research is needed to clarify their combined influence on achievement for this group of students.

Most important are the results of comparisons of the three models by poverty status and depth of poverty. In all three cases examined, the models contributed more to achievement for the group of students not living in poverty than for those living in poverty. But, when controlling for all other variables, the comparison of the contribution of the three models to achievement by depth of poverty revealed very little differences. It should be noted that, overall, the vast majority of models in the original analyses also yielded the same results: 1) more contribution to achievement by variables in the models for the group not in poverty, and 2) very little difference when comparing contribution to achievement for students grouped by depth of poverty. Therefore, we can conclude that depth of poverty is not a factor in how African-American eighth graders respond to certain influences on achievement. Rather, being in poverty, itself, is a factor and students not living in poverty are more likely to live in circumstances where conditions exist that promote achievement.

The implications are strong. According to the Census Bureau (1991), 43% of all African-American children live in poverty. For the most part, this is due to the fact that many of their households have characteristics making them especially prone to poverty: (1) female-headed households, (2) parent(s)' high school dropout(s), and (3) concentration in communities with high proportions of low-income families. Since most welfare programs concentrate on provision of subsistence income and services, they cannot positively impact on school achievement as presently designed. Policies would have to be enacted to assist families to leave the poverty state in order to see positive influences on school achievement from factors such as those examined in this study.

Implications for Educational Policy

Almost all available evidence leads to the contention that the two most influential factors affecting a child's life chances as an adult are socioeconomic status and level of education (Thompson, 1992; Kennedy, Jung & Orland, 1986; Illinois State Board of Education, 1986). Few people would disagree that social conditions in this country have deteriorated over the past few decades. No one knows this better than school personnel who work with children on a daily basis. Most research indicates that subsistence income and compensatory education programs which operate independently of one another are not successful (PA Dept. of Public Welfare, 1989; Conroy, 1990; Kozol, 1991). The federal government must take a lead by providing structure and resources to develop and disseminate information while re-affirming commitment to programs that work (i.e., vocational and technical training). States must follow this lead by bringing disadvantaged children into a national awareness to insure they don't continue to deal with the problems in isolation. The partnerships presently formed between education, business, and welfare agencies deal primarily with training programs for adults (i.e., JTPA, Joint Jobs Initiative, Job Link).(3) Serious consideration must be given to how

interventions can be introduced within the public schools, working with family units to promote conditions that will enhance achievement by breaking the poverty cycle.

Changing demographics in the US have led to a situation in which the majority of new entrants into the workforce by the year 2000 will be members of a minority group. In order to fully understand the changes which will be necessary within the eduational system, at large, to meet the challenges presented by these inevitable circumstances, further research is needed. This research should examine whether similar influences on achievement exist for other minority groups, and whether groups classified by poverty status and depth of poverty are different in regard to their responses to these influences. In addition, an attempt should be made to develop models of contributing factors that will result in more awareness of influence on achievement, especially a model which looks more closely at combined effects of characteristics of the home. This should be done for all ethnic groups, including African-Americans, since it was not part of this study.

If agricultural educators are going to make a difference in recruiting, retaining, and serving diverse populations, they need to relate to all segments of the population. Clearly, individuals trapped in poverty are part of that larger population that need to be addressed. Moreover, if we are ever going to narrow the gap for those that are impoverished, educational programs offer a bridge to a brighter future.

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